

REMARKS

Reconsideration of the above-referenced application in view of the above amendment, and of the following remarks, is respectfully requested.

Claims 1-12 are pending in this case. Claims 1 and 5 are amended herein and claims 13-21 are cancelled herein.

Claim 1 is amended herein to required depositing a second barrier layer over the inner surfaces of the via including the bottom surface of the via. Support for this amendment is found in paragraph [0040] and Fig. 2D.

Claim 5 is amended to incorporate the claim limitations of original claim 1, making claim 5 an independent claim.

The Examiner required a new title on the grounds that the title is not descriptive. The title is amended herein.

The Examiner rejected claims 1-4, 6 and 8 under 35 U.S.C. 102(e) as being anticipated by Xi et al. (U.S. Patent 7,026,238).

Applicant respectfully submits that amended claim 1 is unanticipated by Xi et al as there is no disclosure or suggestion in the reference of depositing a first barrier layer over inner sidewall and bottom surfaces of the via, etching selectively the bottom surface of the via to substantially eliminate the barrier layer from the bottom surface; and depositing a second barrier layer over the inner surfaces of the via including the bottom surface of the via. Xi teaches depositing a first barrier and etching to remove the first barrier from the horizontal surfaces. Xi then teaches depositing a second barrier. However, the second barrier 220 is not deposited on the bottom of the via (see, Fig. 5) as required by the claim. Having the second barrier cover the bottom surface protects

against copper diffusion through misalignment of the via to the underlying copper layer (see, paragraph [0040] and Fig. 2D). Accordingly, Applicant respectfully submits that claim 1 and the claims dependent thereon are unanticipated by Xi.

The Examiner rejected claim 5 under 35 U.S.C. § 103(a) as being unpatentable over Xi et al. (U.S. Patent 7,026,238) in view of Aoi (U.S. Patent 6,197,696).

Applicant respectfully submits that claim 5 is patentable over Xi in view of Aoi as there is no disclosure or suggestion in the references of depositing a first barrier layer, etching selectively the bottom surface of the via to substantially eliminate the barrier layer from the bottom surface, and depositing a second barrier layer, wherein the first barrier layer is a conformal barrier layer of plasma+silane treated CVD TiNSi. As noted by the Examiner, Xi fails to disclose or suggest the first barrier layer being a conformal barrier layer of plasma+silane treated CVD TiNSi. Aoi is applied to teach plasma + silane treatment. However, Aoi teaches a plasma CVD process with silane for forming thick insulating layers. Aoi does not disclose or suggestion plasma + silane treatment for a barrier layer, much less for TiNSi. There is no disclosure or suggestion in the references of the first barrier layer being a conformal barrier layer of plasma + silane treated CVD TiNSi. Accordingly, Applicant respectfully submits that claim 5 is patentable over the references.

The Examiner rejected claim 7 under 35 U.S.C. § 103(a) as being unpatentable over Xi et al. (U.S. Patent 7,026,238).

Applicant respectfully submits that claim 7 is patentable over Xi for the same reasons discussed above relative to claim 1 from which claim 7 depends.

The Examiner rejected claims 9-11 under 35 U.S.C. § 103(a) as being unpatentable over Xi et al. (U.S. Patent 7,026,238) in view of Rozbicki et al. (U.S. Patent 6,607,977).

Applicant respectfully submits that claims 9-11 are patentable over Xi in view of Rozbicki for the same reasons discussed above relative to claim 1 from which these claims depend.

The Examiner rejected claim 12 under 35 U.S.C. § 103(a) as being unpatentable over Xi et al. (U.S. Patent 7,026,238).

Applicant respectfully submits that claim 12 is patentable over Xi for the same reasons discussed above relative to claim 1 from which claim 12 depends.

In light of the above, Applicant respectfully requests withdrawal of the Examiner's rejections and allowance of claims 1-12. If the Examiner has any questions or other correspondence regarding this application, Applicant requests that the Examiner contact Applicant's attorney at the below listed telephone number and address.

Respectfully submitted,

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